



Solar radiation, total column ozone content and aerosol optical properties monitoring at the ground-based station in Kishinev, Moldova

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For the first time in Moldova a ground-based solar radiation monitoring station was established. The station is situated in an urban environment of Kishinev (Lat=47.0013N, Lon= 28.8156E, h=205 m a.s.l.). Continuous measurements of solar radiation from UV-B to IR are carried out with the radiometric complex which is a back-bone of the station. The complex consists of active solar tracker and stationary platform to make measurements of direct and diffuse, and global components of solar radiation, respectively. Total column ozone content is regularly measured with the hand-held ozonometer MICROTOPS II. Sunphotometer Cimel CE-318 is used to make measurements of the spectral direct Sun and diffuse sky radiances (in almucantar and principal planes) to retrieve aerosol optical and microphysical properties within the frame of the Aerosol Robotic Network (AERONET) program, managed by NASA/GSFC. Radiometric and ozone data are supplemented with meteorological parameters acquired with the station MiniMet collocated with the radiation complex. Monthly mean values of total column ozone measured at the Kishinev ground-based station from July 2003 to December 2004 are presented. These data are analyzed in comparison with ones retrieved from the measurements from the Earth Probe (EP) TOMS satellite platform. Correlation coefficient between these datasets is 0.985 and bias is $\sim 5\%$ between daily means. Maximum, minimum and mean values of total column ozone measured for this period were ~ 489 DU, 255 DU, and $\sim 332 \pm 38$ DU, respectively. Correlation coefficient between measured solar UV-B erythemal weighted radiation and total column ozone for cloudless days was ~ -0.93 . Time series of monthly totals for global and diffuse

components of solar and UV-B erythemal weighted radiation (on horizontal plane) are presented. A distinct seasonal dependence exists for these series. As an example a diurnal variation of the hourly totals of solar (0.28 - 3 μm) and Photosynthetically Active Radiation (PAR, 400-700 nm), and atmospheric longwave (4.5-42 μm) radiation is presented for clear cloud free days nearest to the winter and summer solar solstice. Multi-year statistics are presented for monthly means and seasonal averaged values of aerosol optical properties retrieved from sunphotometer measurements for the period from September 1999 to October 2004. It was shown that monthly mean values of aerosol optical thickness (AOT) at 500 nm are ranged from 0.14 (in winter) to 0.38 (in summer) with multi-year yearly mean value of AOT $\sim 0.23 \pm 0.08$. Monthly mean values of the Angstrom exponent retrieved within spectral range 440-870 nm vary from ~ 1.32 (in winter) to ~ 1.71 (in summer) with multi-year yearly mean value of $\sim 1.44 \pm 0.13$. Time series of monthly mean values of relative humidity, air temperature and mean wind speed measured by the automatic weather station are also presented. The work was funded by the U.S. Civilian Research Development Foundation (CRDF) and the Moldovan Research and Development Association (MRDA) through grant ME2-3033.